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Claims

1. (Currently amended) A computer-readable medium storing computer-executable instructions for causing a computer system programmed thereby to perform a method comprising A method for assessing a relationship of an interface to a unit, wherein a software program comprises plural units, and wherein a unit exposes one or more interfaces, the method comprising:

detecting a reference to an interface of a unit of software, wherein a software program comprises plural units, and wherein one of the plural units exposes the interface;

determining if the unit that exposes the interface is known has been wrapped by checking a data structure that tracks interface wrapping for the plural units of the software program comprising one or more entries, wherein an entry maps an interface to a unit identity;

if the interface has been wrapped, returning a reference to an existing entry for the interface from the data structure, wherein the existing entry associates the interface with a unit identity for the unit that exposes the interface;

if the unit that exposes the interface is not known has not been wrapped,

discovering the unit identity of the unit that exposes the interface;

adding as a new entry to the data structure, wherein the new entry maps associates the interface to with the discovered unit identity; and

returning a reference to the new entry.

performing an operation based upon an entry of the data structure.

2. (Canceled)

3. (Currently amended) The computer-readable medium method of claim 1 wherein the step of detecting comprises:

noting one or more return parameters from a called function; and

parsing the one or more return parameters to detect [[a]] the reference to an the interface.

4. (Currently amended) The computer-readable medium method of claim 3 wherein the called function is a unit creation function.

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5. (Currently amended) The computer-readable medium method of claim 1 wherein the step of detecting comprises:

noting one or more outgoing parameters to a called function; and

parsing the one or more outgoing parameters to detect ~~[[a]]~~ the reference to ~~an~~ the interface.

6. (Currently amended) The computer-readable medium method of claim 1 wherein the data structure ~~is comprises~~ a hash table, and wherein the step of determining comprises:

hashing the detected reference;

~~if the detected reference hashes to a unit identity, returning a value that indicates the unit identity of the unit that exposes the interface is known; and~~

~~if the detected reference does not hash to a unit identity, returning a value that indicates the unit identity of the unit that exposes the interface is not known.~~

7. (Currently amended) The computer-readable medium method of claim 1 wherein the data structure ~~is comprises~~ a hash table, wherein the step of adding ~~an~~ the new entry comprises:

creating ~~[[a]]~~ the new entry in the hash table, wherein the new entry associates the interface with the discovered unit identity.

8. (Currently amended) The computer-readable medium method of claim 1 ~~wherein an interface wrapper stores data comprising a unit identity~~, wherein the data structure ~~is comprises~~ a hash table for associating interfaces with interface wrappers, wherein the existing entry is for an existing interface wrapper in the hash table, and wherein the step of determining comprises:

hashing the detected reference;

~~if the detected reference hashes to an interface wrapper, returning a reference to the interface wrapper; and~~

~~if the detected reference does not hash to an interface wrapper, returning a value indicating that the interface does not have an interface wrapper.~~

9. (Canceled)

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10. (Currently amended) The computer-readable medium method of claim 1 ~~wherein an interface wrapper stores data comprising a unit identity~~, wherein the data structure is comprises a hash table for associating interfaces with interface wrappers, and wherein the new entry is for a new interface wrapper that stores the unit identity, ~~the method further comprising:~~
~~if the unit that exposes the interface is not known,~~
~~creating an interface wrapper, wherein the interface wrapper stores data comprising the discovered unit identity; and~~
~~during the step of adding an entry, creating a new entry in the hash table, wherein the new entry associates the interface with the created interface wrapper.~~

11. (Currently amended) The computer-readable medium method of claim 1 wherein a local variable stores data comprising the unit identity of the unit that exposes the interface from which the detected reference originated, and wherein the step of discovering the unit identity comprises noting the value stored in the local variable.

12. (Currently amended) The computer-readable medium method of claim 11 wherein an instrumentation system provides the unit identity of the unit that exposes the interface from which the detected reference originated.

13. (Currently amended) The computer-readable medium method of claim 1 wherein the method further comprises comprising:
if the unit that exposes the interface is known has been wrapped,
verifying the unit identity of the unit that exposes the interface; and
~~overwriting an entry of the data structure, wherein the entry maps the interface to the~~
~~verified unit identity.~~

14. (Currently amended) The computer-readable medium method of claim 1 ~~wherein the step of performing an operation upon an entry of the data structure comprises wherein the method further comprises:~~
detecting a communication passing through the interface;
measuring the size of the communication;

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determining the unit identity of the unit that exposes the interface from the returned reference to the existing or new entry of the data structure; and
associating the measured size with the unit that exposes the interface.

15. (Currently amended) The computer-readable medium method of claim 1 ~~wherein the step of performing an operation based upon an entry of the data structure comprises wherein the method further comprises:~~

receiving from a client unit a call to a unit activation function for a unit to be activated among the plural units from a client unit;
determining [[the]] a unit identity of the client unit from the entry of the data structure;
classifying the unit to be activated based upon the unit identity of the client unit, resulting in a classifier;
determining a location in a distributed computing environment using the classifier; and
routing the call to the location.

16. (Currently amended) A computer-readable medium storing computer-executable instructions for causing a computer system programmed thereby to perform a method comprising A method for assessing a relationship of an interface to a unit, wherein a software program comprises plural units, and wherein a unit exposes one or more interfaces, the method comprising:

on receiving a reference to an interface as a return parameter from a function call,
determining if the unit that exposes the interface is known wrapped by checking a data structure that tracks interface wrapping for plural components of software, wherein one of the plural components exposes the interface comprising one or more entries, wherein an entry maps an interface to a unit identity;

if the unit that exposes the interface is not known wrapped,
discovering the unit component identity of the unit component that exposes the interface; and

adding an a new entry to the data structure, wherein the new entry maps associates the interface to with the discovered unit component identity; and
performing an operation based upon an entry of the data structure.

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17. (Canceled)

18. (Currently amended) The computer-readable medium method of claim 16 wherein the data structure is comprises a hash table, and wherein the step of determining comprises:

hashing the ~~detected~~ received reference;

~~if the detected reference hashes to a unit identity, returning a value that indicates the unit identity of the unit that exposes the interface is known; and~~

~~if the detected reference does not hash to a unit identity, returning a value that indicates the unit identity of the unit that exposes the interface is not known.~~

19. (Currently amended) The computer-readable medium method of claim 16 wherein the data structure is comprises a hash table, wherein the step of adding ~~an~~ the new entry comprises:

creating ~~[[a]]~~ the new entry in the hash table, wherein the new entry associates the interface with the discovered unit component identity.

20. (Currently amended) A computer-readable medium storing computer-executable instructions for causing a computer system programmed thereby to perform a method comprising A method for assessing a relationship of an interface to a unit of software using an interface wrapper, wherein the software comprises plural units, and wherein a unit of software exposes one or more interfaces, the method comprising:

detecting a reference to an interface, wherein one of plural components of software exposes the interface of a unit of software;

determining if the interface is wrapped using a hash table for associating an interface with an interface wrapper;

if the interface is wrapped, providing to a client component a reference to an existing interface wrapper, wherein the existing interface wrapper stores a reference to instrumentation, the reference to the interface, and component identity of the component that exposes the interface;

if the interface is not wrapped,

creating ~~[[an]]~~ a new interface wrapper for the interface, wherein the new interface wrapper stores ~~[[a]]~~ the reference to the instrumentation and the reference to the interface;

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creating a new entry in the hash table, wherein the new entry associates the interface with the created new interface wrapper;
_____ discovering the unit component identity of the unit component that exposes the interface;
_____ storing in the new interface wrapper the unit component identity of the unit component that exposes the interface; and
_____ providing to [[a]] the client unit component a reference to the new interface wrapper;
and
receiving from the client unit component an invocation of the instrumentation through the provided reference to the existing or new interface wrapper.

21. (Canceled)

22. (Currently amended) The computer-readable medium ~~method~~ of claim 20 wherein the step of determining ~~whether~~ if the interface is wrapped comprises:
hashing the detected reference;
if the detected reference hashes to [[an]] the existing interface wrapper, returning [[a]] the reference to the existing interface wrapper; and
~~if the detected reference does not hash to an interface wrapper otherwise,~~ returning a value that indicates the interface is not wrapped.

23. (Currently amended) The computer-readable medium ~~method~~ of claim 20 wherein the reference to instrumentation comprises a pointer to a table comprising at least one pointer to one or more instrumentation functions.

24. (Currently amended) The computer-readable medium ~~method~~ of claim 20 wherein the step of creating [[an]] the new interface wrapper further comprises storing in the new interface wrapper a type description of the interface.

25. (Currently amended) The computer-readable medium ~~method~~ of claim 20 wherein a local variable stores the unit component identity of the unit component that exposes the interface

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~~from which the detected reference originated~~, and wherein the step of discovering the component identity of the ~~unit~~ component that exposes the interface comprises noting the value stored in the local variable.

26. (Currently amended) The computer-readable medium method of claim 20 wherein the invocation comprises a communication from the client ~~unit~~ component directed towards the ~~unit~~ component that exposes the interface, the method further comprising:

measuring the size of the communication using the instrumentation;
associating the measured size with the ~~unit~~ component that exposes the interface and the client ~~unit~~ component; and
calling the ~~unit~~ component that exposes the interface.

27. (Currently amended) The computer-readable medium method of claim 26 wherein the method further comprises ~~comprising~~:

before the step of calling the ~~unit~~ component, setting a return address for returning from the called ~~unit~~ component as a reference to the instrumentation;
after the step of calling the ~~unit~~ component, receiving from the ~~unit~~ component that exposes the interface a second invocation of the instrumentation, wherein the second invocation comprises a second communication from the ~~unit~~ component to the client ~~unit~~ component;
measuring the size of the second communication using the instrumentation;
associating the measured size of the second communication with the ~~unit~~ component that exposes the interface and the client ~~unit~~ component; and
returning control to the client ~~unit~~ component.

28. – 56. (Canceled)

57. (Currently amended) A computer-readable medium storing computer-executable instructions for causing a computer system programmed thereby to perform a method comprising A method for handling an undocumented interface between a client unit and a server unit of an application program, wherein the interface comprises one or more functions, and wherein a description file comprises a description of the interface, the method comprising:

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receiving from a client unit a call to a function of an interface;
determining if the interface is documented based upon [[the]] description of [[the]] a
description file;
if the interface is undocumented,
transferring execution to the function, wherein the function performs an operation;
and
after the function completes,
transferring execution to the client unit.

58. (Canceled)

59. (Currently amended) The computer-readable medium method of claim 57 wherein a
call stack holds one or more parameters of the call to the function pushed by the client unit, and
wherein a stack pointer points to the top of the stack, the method further comprising:

if the interface is undocumented, before the step of transferring execution to the function,
storing the value of the stack pointer;
after the function completes, before the step of transferring execution to the client unit,
popping the one or more parameters from the call stack;
calculating the size of the one or more parameters based upon the stored value of the
stack pointer and the current value of the stack pointer; and
storing the calculated size in the description file.

60. (Currently amended) The computer-readable medium method of claim 57 wherein a
call stack holds a return address for the client unit pushed by the client unit, the method further
comprising:

if the interface is undocumented, before the step of transferring execution to the function,
storing the return address for the client unit;
replacing the return address for the client unit on the call stack with a return address
for an instrumentation function;
after the function completes, before the step of transferring execution to the client unit,
popping the return address from the call stack; and

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transferring execution to the instrumentation function.

61. (Currently amended) The computer-readable medium ~~method~~ of claim 57 wherein a call stack holds one or more parameters of the call to the function pushed by the client unit, wherein the call stack holds a return address for the client unit pushed by the client unit, and wherein a stack pointer points to the top of the stack, the method further comprising:

- if the interface is undocumented, before the step of transferring execution to the function,
 - storing the value of the stack pointer;
 - storing the return address for the client unit;
 - replacing the return address for the client unit on the call stack with a return address for an instrumentation function;
- after the function completes, before the step of transferring execution to the client unit,
 - popping the return address from the call stack; and
 - popping the one or more parameters from the call stack;
- transferring execution to the instrumentation function;
- calculating the size of the one or more parameters based upon the stored value of the stack pointer and the current value of the stack pointer; and
- storing the calculated size in the description file.

62. (Canceled)

63. (Currently amended) The computer-readable medium ~~method~~ of claim 57 wherein the step of determining if the interface is documented comprises:

- examining the description file; and
- if the description file contains no description, indicating that the interface is undocumented.

64. (Currently amended) The computer-readable medium ~~method~~ of claim 57 wherein the step of determining if the interface is documented comprises:

- examining the description file; and
- if the description file contains inadequate information for parsing a communication across the interface, indicating that the interface is undocumented.

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65. (Currently amended) The computer-readable medium ~~method~~ of claim 57 wherein a data structure stores an identifier for the client unit and an identifier for [[the]] a server unit, the method further comprising:

if the interface is undocumented,

noting the relationship of the undocumented interface to the client unit and the server unit based upon the identifiers; and

noting a pair-wise location constraint between the client unit and the server unit.

66. (Canceled)

67. (New) The computer-readable medium of claim 1 wherein the computer-executable instructions are for automatic distributed partitioning system software.

68. (New) The computer-readable medium of claim 1 wherein the reference to the interface is a pointer to the interface.

69. (New) The computer-readable medium of claim 16 wherein the computer-executable instructions are for automatic distributed partitioning system software.

70. (New) The computer-readable medium of claim 16 wherein the reference to the interface is a pointer to the interface.

71. (New) The computer-readable medium of claim 20 wherein the computer-executable instructions are for automatic distributed partitioning system software.

72. (New) The computer-readable medium of claim 20 wherein the reference to the interface is a pointer to the interface.

73. (New) The computer-readable medium of claim 57 wherein the computer-executable instructions are for automatic distributed partitioning system software.